COCONINO COUNTY — Department of Community Development
2500 North Fort Valley Road, Building 1 Flagstaff, AZ 86001 Phone: (928) 679-8850 Fax: (928) 679-8851

2006 INTERNATIONAL CODE & ORDINANCE CHANGES

INSPECTIONS

1. A **$94.00 re-inspection fee** will be charged for: **1)** work not ready at time of inspection, **2)** no plans on job site, **3)** inspection card not posted, and **4)** corrections called for re-inspection not completed.

2. It is the responsibility of the contractor or owner to have animals, e.g., dogs, contained when inspections are made. Premises are to be unlocked at time of inspection; if not, a **$94.00 re-inspection fee** will be charged.

3. If a **$94.00 re-inspection fee** is charged, it is the responsibility of the contractor or the owner to come into the office, at 2500 N. Fort Valley Rd., Bldg. 1 Flagstaff Arizona, 86001-1287, and pay the fee. At which time you can schedule a time for a follow up inspection. **No further inspections will be done until the fee has been paid.**

LISTED ARE THE REQUIRED INSPECTIONS.

(a) **FOOTINGS**: Setbacks, Building Site Fills, Retaining Walls, Building Locations, Trench, Reinforcement, Electric Ground (Ufer), Footings, etc. The Site according to the site plan requirements. **INSPECTION MUST BE APPROVED BEFORE ORDERING CONCRETE**.

STEM WALL, PIERS AND MASONRY WALLS: Vents, Crawl Access, Reinforcement, Anchorage, Masonry Openings, All Forms shall be stripped before back filling, Block, Under floor Clearances, Girder pockets, Waterproofing and Drain Tile, Grout Placement, Masonry Planters, Retaining and Fireplaces, Insulation, etc. **INSPECTION MUST BE APPROVED BEFORE ORDERING GROUT**

(b) **UNDER SLAB**: Plumbing, Electric conduit, Compaction, Bearing Turndown, Braced Wall Line Footings**, Insulation locations as per Coconino County Building Details.** etc. **INSPECTION MUST BE APPROVED BEFORE ORDERING GROUT (CONCRETE)**

(c) **FLOOR FRAMING**: Sill Plates, Joist Size and Spacing, Girder Size, Load Bearing Members, Anchorage, Under Floor Clearance, Trenches Backfilled, and Crawl Space Clean of Debris, Log Homes - Log Spike Requirements, etc. **BEFORE THE FLOOR SHEATHING IS INSTALLED.**

(d) **ROOF SHEATHING, SHEAR WALLS AND ANCHORAGE**: Wall Framing, Second Floor Framing, Fire Blocking, Floor Sheathing, Roof Framing. Ice Dam Eave Protection, Stair Framing, Emergency Exit Windows (Rough Openings), Safety Glass (Location Identified), Attic Access, Framing Anchors and Wall Bracing, Plumbing Walls (2" x 6"), Fire Wall and Fire Ceiling Framing, Drywall Backing, Wood to Earth Separation, Flashing (Vents thru roof, saddles and crickets built.), Building Height. **BEFORE ROOF COVERING, BUILDING WARP, WINDOW FLASHING AND AIR BARRIER.**

(e) **BUILDING WRAP, WINDOW FLASHING and AIR BARRIER**: Building Wrap, Window and Door Flashing, Tub/Shower Enclosures, Kitchen Soffit/Chases, Dropped Ceilings, Fireplace Enclosures, Attic Side Knee Walls, Raised platform to attic equipment. **BEFORE THE START OF PRE-DRYWALL – ROUGH TRADES.**

(f) **ROUGH TRADES**: Framing Complete, Exit Windows Installed, Safety Glass Locations, Rough Electric, Plumbing, Mechanical, Weather Proofing, Roof Covering, Flashing, Siding and Rough Smoke Detectors, Drywall Inspection for Air Barrier (Tub/Shower, Kitchen Soffit/Chases, Fireplace Enclosure, etc), Approved Sill Seal Gasket Under Bottom plate for Slab on Grade Construction, All Penetration of Electrical Wire and Plumbing Through the Top Plate and the Bottom Plate shall be Fire-Resistive Caulked, Ducts, Flue and Piping Shafts Openings into Unconditioned Spaces shall be Capped and Sealed, Ceiling Penetrations (Such as Light Fixtures Adjacent to the Building Thermal Envelope shall be Caulked, Gasketed or Boxed out). **BEFORE INSULATION INSTALLATION.**

(g) **INSULATION**: Roof and Ceilings Batts. (R-38), Vaulted Ceiling (R-30), Floors (R-30), 2"x 6" Walls (R-19) & 2" x 4" Walls (R-15). Hot Water Pipes in Unconditioned Spaces (R-2) Allowance for blown insulation in attic after drywall. **BEFORE DRYWALL COVERING.**

(h) **DRYWALL NAILING**: Fire Resistive Walls, Green Board, Gypsum Sheathing, Correct Nails/Screws Size and Spacing. **APPROVED BEFORE TAPE AND TEXTURE.**

(i) **MISCELLANEOUS INSPECTIONS**: Temporary Electric Service, Sewer Line, Water Service, Lath Inspection for Stucco, Stone or Brick Veneer, Irrigation Systems Special Inspection, etc.

(j) **FINAL**: Final Building, Electrical, Plumbing, Mechanical, Health Department Septic Final, Yard Grading and Drainage, Slash Removed from Site, etc. **BEFORE OCCUPANCY**

(k) **Street numbers shall be displayed so as to be conspicuously visible from the street from both directions. If the address number on a structure is not clearly visible from the street, it must be displayed near the street in a location that is conspicuously visible from the street from both directions. Size requirements for street numbers are a minimum of 4" inches in height.**

NOTE: Check Coconino County schedule of inspections for a complete list.

THESE ITEMS ARE REQUIRED IN ADDITION TO RED LINES ON PLANS WHEN APPLICABLE

Coconino County Building Department Code Enforcement: International Building Code, International Residential Code, International Mechanical Code, International Fuel Gas Code, International Plumbing Code, International Energy Conservation Code, 2006 editions; NEC 2005 edition. Other items amended and listed in our Coconino County Building Code Guidelines Book.

2006 INTERNATIONAL BUILDING CODE

1. **It is the responsibility of the contractor or owner to have property lines marked** so the inspector can determine setbacks at time of the footing inspection. A survey of the lot may be required by the Building Official to verify that the structure(s) are located in accordance with approved plans.

2. **Revisions, Additions or Deletions shall be submitted to the Building Department and approved and fees paid for prior to the start of that work. The change shall be submitted with an application, plans and specifications and when reviewed and approved and fees will be assessed according to the Department Policy.**

3. Fill material:

    a. Fill material for slab floors in excess of Four (4) ft. in depth shall be an engineered fill and have a soils report for verification of compaction. Engineered fill and soils report shall also be required for exterior and interior bearing footings and foundations which do not extend into undisturbed soil.
    b. Fill material which is used in slab floor construction shall be limited to 3/8 inch or less dirty cinder, ABC (aggregate base course), or Native material when approved by the Building Inspector.
    c. Fill built on a parcel of land such as a building pad, in excess of 4', the fill shall be designed by an engineer and soils tests and report provided prior to footing inspection..
    d. Any foundation system constructed on fill material, the fill and the foundation system shall be designed by an engineer and the plan stamped.
    e. Any fill designed by an engineer, the plans shall show type of fill material and methods of placement.

4. STEM - Vents 1 sq. ft. of opening for every 150 sq ft of area, one (1) Ventilating opening shall be within 3’ feet of each corner of the building

5. Footings may be attached, drilled and pinned, to bedrock ledges and to large boulders that are unfeasible to remove only when the footing trench has been dug down no less that 18” inches into undisturbed soil. The top of a single large boulder may encroach a maximum of 12” inches within the top of the footing trench.

6. The attachment shall be made by drilling into the rock a minimum of 8” inches and using a #4 (1/2”) rebar pin driven into the hole securely or use epoxy adhesive, with an extension of the rebar a minimum of 15” inches long to make a lap with the footing or stem wall rebar. The pin spacing shall be no less the 4’ feet on center and 12” inches on center when stepping over boulders.

7. Drilling and pinning of footings to rock located less then 18” inches into undisturbed soil, the attachment of the pins shall be designed and the plans stamped by an Arizona registered engineer.

8. The floor elevation of the garage slab shall be a minimum of 3-1/2” inches lower than the finish floor height of the house. The garage floor shall slope 1/8” inch per foot toward the garage door.

9. Structures located in Seismic Design Categories Do, D1 and D2 shall have exterior and interior braced wall lines.

10. Spacing between braced wall lines in each story shall not exceed 25' feet on center in both the longitudinal and transverse directions.

    Exception: In one- and two-story buildings, spacing between to adjacent braced wall lines shall not exceed 35' feet on center in order to accommodate one single room not exceeding 900 square feet in each dwelling unit. Spacing between other braced walls lines shall not exceed 25' feet.

11. Braced Wall Lines

    a. Spacing shall not exceed twenty-five (25') feet on center in both the longitudinal and transverse directions in each story.
    b. Allow 1 inch x 4 inch Let-in Bracing
    c. Allow 1 inch x 4 inch let-in bracing for seismic Category Do for one story and the top floors of two and three story wood frame buildings.
    d. Materials Excluded for Bracing for Walls; drywall, fiberboard, and stucco as bracing materials.
    e. Requirements for Wall Bracing
    f. Exterior, main interior and interior bearing walls shall be braced at ends and every twenty-five (25') feet on center along walls.
    g. In two story wood frame buildings, one (1") inch by six (6") inch wood let-in bracing may be used on the first floor. In three story buildings, one (1") inch by six (6") inch let-in bracing may be used on the second story. In no case shall there be less than twenty-five (25') percent coverage of the building length.
    h. The first floor of a three-story building shall have not less than forty (40) percent of the wall length solidly sheathed.
    i. Flat strap bracing may be used in lieu of one (1") inch by four (4") inch let-in bracing when installed in an "X" fashion as per manufacturers' specification
    j. Walls shall be braced with sheathing panels for not less than a full four (4') feet by eight (8') feet of the wall length when doors, windows or other obstructions are located within eight (8') feet of the wall corners or within twenty-five (25') foot spacing of braces.
    k. Walls adjacent to garage door openings, which are less than eight (8') feet in length, shall be solidly sheathed.

12. When a rigid insulation sheathing panel is installed over the exterior of the stud construction, then the provisions of wall bracing, lettered f through k shall apply.

13. For the purposes of complying with the International Energy Code 402.4 and the International Residential Code N1102.4 for Air Leakage all conditioned spaces of building construction shall have the exterior walls solidly sheathed with 3/8 inch structural panel minimum, exterior panel siding or approved thermal energy brace sheathing panel. This shall be considered as meeting the requirements for bracing of exterior walls.

14. Alternate Braced Wall Panels next to doors and window openings.

    a. Minimum width of braced wall panel 16” for one story, 24” for two stories.
    b. Fasten top plate to header with 2 rows of 16d sinker nail at 3” o.c., Strap header to bearing stud (strap 1000 pounds uplift capacity)
    c. Sheathing (3/8” minimum) shall extend up and over the solid sawn or glues-laminated header, nailed Sheathing to header with 8d in a 3” grid pattern and 3” o.c. in all framing (studs, blocking, and sills)
    d. 1-5/8” x 10” anchor bolt shall be installed in the center of each sill plate, the studs at each end of the panel shall have a tie-down device fastened to the foundation, (uplift capacity of not less than 4200 pounds). For Braced wall panels of 4’ feet; 2 anchor bolts are required at 12” from ends and shall have a tie-down device fastened to the foundation (uplift capacity of not less than 4200 pounds).
    e. Maximum Height for braced wall panel 10’.

15. Braced wall lines sills shall be anchored to concrete or masonry foundation, with 1/2” x 10” anchor bolts at six (6’) ft. on center and 12” from ends of plate for one (1) story building, four (4’) ft on center and 12” from the ends plates for building over two (2) Stories, with washers of 0.229 inch by 3 inches by 3 inches. Braced wall lines shall be fastened to floor and roof framing. First floor braced wall lines supported on doubled floor joists, continuous blocking or floor beams, shall be nailed with 3 – 16d at 16” on center.

    a. Floor joist parallel to the top plate shall be toe-nailed to the top plate with at least 8d nails at 6” on center.
    b. Top plate laps shall be face-nailed with at least (8) – 16d nails on each side of the splice.

16. Decking on exterior decks shall have a maximum spacing of 1/4” inch after shrinkage. Amended Part 1 # 36

17. Wall framing details.

    a. All framing corners shall be accessible to allow complete insulation.
    b. At exterior corners the third required stud shall be placed parallel with the plate for interior wall covering backing so as to allow full insulation between the stud space of 16” inches or 24” inches. The parallel stud shall make full contact with the stud of the perpendicular wall for structural nailing. (California Corner)
    c. At intersection of an exterior wall and an interior partition the normal stud spacing shall be maintained for exterior wall with blocking installed (ladder blocking) at 16” inches on center for attachment of the intersecting interior wall and as the required backing for interior wall covering.

18. Wood shall maintain these clearances to earth or be R.W. or P.T. wood:

    a. 7" - Wood on slabs or stems to earth
    b. 6" - Siding to earth
    c. 7" - Girders and joists for exterior decks to earth
    d. 12"- Girders, in under floor spaces, to earth
    e. 18"- Joists, in under floor spaces, to earth
    f. 8" - Posts on individual piers to earth
    g. 7 " - Posts on pedestals
    h. 1" - Posts shall be 1" above concrete slabs in garages, porch slabs, basements, and areas subject to water splash or standing water
    i. 2" – Wooden stair stringers to earth; install on concrete pad, R.W. or P.T. wood
    j. Wooden posts shall be separated from concrete by R.W., P.T. wood or metal plate, in all cases
    k. Foundation and deck ledgers shall be R.W., P.T. wood or have galvanized sheet metal between the wood and the masonry or concrete

19. Under floor crawl space:

    a. Access opening 18" X 24" minimum with a door.
    b. Vents 1 sq. ft. of opening for every 150 sq ft of area, one (1) Ventilating opening shall be with in 3’ feet of each corner of the building.
    c. Ground clearance - 18" to joists, 12" to girders.
    d. Crawl space shall be clean of debris. Trenches around stem walls and piers shall be backfilled at both interior and exterior locations. IRC R408.1, R408.4

20. Need Hurricane ties at 4’ on center on all floor joist and deck joist when installed over girders and beams.

21. Doubled joist under bearing partitions, sized to adequately support the load , that are separated to permit the installation of piping or vents shall be full depth solid blocked with lumber not less than 2” inches in nominal thickness spaced at 4’ feet on center. IRC R502.4.

22. Floor / Rafter framing: -- Notching $1/6^{th}$ of the depth of the member, shall not be longer than $1/3^{rd}$ of the depth of the member, and shall not be located in the middle $1/3^{rd}$ of the span. Notches at the ends of the member shall not exceed $1/4^{th}$ the depth of the member. The diameter of holes bored or cut into members shall not exceed $1/3^{rd}$ the depth of the member. Holes shall not be closer then 2 inches to the top or bottom of the members or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches to the notch. Solid beams, manufactured beams (G.L.B) manufactured joists and trusses shall not be cut, notched nor have holes bored. IRC R502.8.1 & IRC R802.7.1.

23. Joists shall be supported laterally at the ends by full depth solid blocking not less than 2” inches nominal in thickness; or by attachment to a full-depth header, band or rim joist, or to an adjoining stud or shall be otherwise provided with lateral support to prevent rotation.

a. Exception; In Seismic Design Categories Do, D1 and D2 lateral restraint shall also be provided at each intermediate support.
b. Joists exceeding a nominal 2" x 12" shall be supported laterally by solid blocking, diagonal bridging, or continuous 1" x 3" strips nailed across the bottom of the joist, at 8' feet on center.

24. Engineered truss installations shall be according to manufactured specifications for bearing points and catwalk supports. Trusses shall be braced diagonally at each end and every 25' o.c., Lateral bracing and hurricane ties as per manufactured truss specifications.

25. Trusses and joists shall be designed to carry the extra load of heating or other equipment that will be installed in attic locations. Also a raised passageway and a raised platform shall minimum for a 12" inch space for the installed of R-38 the insulation may be installed under these areas.

26. The ends of each rafter or ceiling joist shall have 1-1/2" of bearing on wood or metal and 3" on masonry or concrete.

27. Rafters and ceiling joists having a depth to thickness ratio 5 to 1 shall be provided with lateral support at the points of bearing to prevent rotation.

28. Rafters and ceiling joist having a depth to thickness ratio 6 to 1 shall be supported laterally by solid blocking, diagonal bridging, or continuous 1" x 3" strips nailed across the bottom of the joist, at 8' feet on center.

29. Attic Space Vents 1 sq. ft. of opening for every 150 sq. ft. of area or 1sq. ft. of opening for every 300 sq. ft. when at least 50 % and not more tan 80% of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3' feet above the eaves or cornice vents.

30. 1/2" roof sheathing shall be rated 32/16 minimum. 1/2" roof sheathing on a roof pitched 5/12 or less and supported at 2' o.c. shall have edges blocked or use ply clips at 24" on center. 1/8" gap required regardless.

31. Areas where live load (snow) is thirty (30) pounds per square foot or more and the pitch is 5-12 or less, 5-ply – one-half (1/2") inch plywood or 32/16 rated OSB sheathing on supports twenty-four (24") inch o.c. shall have blocking or ply clips on the edges.

32. When heavy roof covering is applied to structures such as cement or clay tile the roof sheathing shall be 5/8" inch structural panels of plywood or OSB with a panel rating of 40/20 minimum.

33. All roofing shall have"Class B" minimum fire classification roof material installation assemblies to be non-combustible roofing with approved listed underlayment. See #40 a.

34. Roof slopes less than 2:12 shall be a membrane roof covering, hot mop or torch down "Class B" minimum.

35. Wood shake and shingles for roof covering shall have a Class B fire resistive rating and warranted for the life of the material for no re-treatment.

    a. Metal roofing shall be installed as a Class B roof covering assembly by using approved underlayment sheets that are fire resistive, installed according to the requirements of their listing.
    b. Listed and approved Solar Type shingles for the purposes of generating electric power may be used that have a minimum of a Class C roof covering assembly, installed according to manufacturer's specifications placed over underlayment sheets that are fire resistive.

36. Severe Climate - in all areas of Coconino County (except Page, Tuba City,) roof eaves shall be protected as follows: Asphalt shingles - #40 coated roofing, with laps cemented together, installed on the eave and beyond the interior wall line 24". Asphalt shingles for roof pitch 2:12 to less than 4:12 - two additional layers of 15# felt, laps cemented together, installed on the eave and beyond the interior wall line 24". Wood shingles and shakes - two additional layers of 15# felt applied shingle fashion, solidly cemented together, installed on the eave and beyond the interior wall line 36".

37. Smoke detectors shall be required in garages, storage areas, or workshops and shall be audible simultaneously with smoke detectors throughout the dwelling unit. If a dwelling has a vaulted ceiling, a smoke detector shall be installed between twelve (12") inches and eighteen (18") inches below the ridge beam or the peak and shall be audible simultaneously with smoke detectors throughout the dwelling unit. Smoke detectors installed on walls or ceilings shall be kept a minimum of twelve (12") inches away from the corner. (Manufacturers specifications recognize a dead air space within twelve (12") inches of the inside corners.)

38. Smoke detectors shall be required in each bedroom or similar rooms which could be used for sleeping purposes and outside each separate area in the immediate vicinity of the bedroom.

39. Windows located above the first floor or on any floor where the floor level is 4' feet above adjacent ground level or floor below shall have the rough frame window sill installed 34" inches above the floor or guardrails shall be installed over the opening as required by code.

    When guardrails are installed over emergency escape windows the guardrails shall comply with the code.

40. Egress requirements:

    a. Minimum opening area, 5.7 square feet.
    b. Minimum opening height, 24" inches
    c. Minimum opening width, 20" inches
    d. Minimum opening area, 5.0 square feet (Grade floor Openings) with in 4' – 0" of adjacent grade below.
    e. Maximum sill height of 44" inches.
    f. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge.

g. The net clear opening dimension required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside, with out the removal of the window sash.

41. Below grade basements shall have at least two windows to the outside that meet "Emergency Escape" requirements plus adequate openings for light and ventilation.

42. Any floor at grade level shall have a 3068 (3' x 6'8") door of the swing type, minimum exit door directly to the outside.

43. Exterior doors of single family dwelling other than the required exits shall have a width of not less than 2868 (2'8" x 6'8"). The common door between home and garage shall also be 2868 (2'6"x6'8"). The minimum required door height of (6'8") shall remain the same for all door for habitable space, Exception: 5' sliding glass and atrium door units.

44. All detached accessory structures i.e.: garages, storage sheds, and barns shall have at least one (1) 3068 (3' X 6'8") minimum hinged, swinging door to the outside which meets the requirements as for a required exit door.

Exceptions:

a. The required exit door shall not be required in barns with a floor area of less than one thousand (1000) square feet when the sides of the barn are open with stalls that have stall gates to the outside
b. Shipping Containers for storage only when allowed by Planning and Zoning.

45. There shall be no door opening from a garage, workshop, or storage room into a bedroom or sleeping area.

46. The minimum length of screw fasteners for 5/8" inch gypsum wall board shall be a 1 5/8" inch type S or Type W screw. For tile installations on walls and ceilings in tub and shower enclosures use cement backer board only.

47. Three-eighths-inch-thick single-ply gypsum board shall not be used on a ceiling where a water-based textured finish is to be applied, or where it will be required to support insulation above a ceiling. On ceiling applications to receive a water-based texture material, either hand or spray applied, the gypsum board shall be applied perpendicular to framing. When applying a water-based texture material, the minimum gypsum board thickness shall be increased from 3/8 inch to 1/2 inch for16-inch on center framing, and from 1/2 inch to 5/8 inch for 24-inch on center framing or 1/2-inch sag-resistant gypsum ceiling board shall be used. IRC Table R702.3.5 Note (d)

48. Type X gypsum board for garage ceilings beneath habitable rooms shall be installed perpendicular to the ceiling framing and shall be fastened at maximum 6 inches o.c. by minimum 1-7/8 inches 6d coated nails or equivalent drywall screws. IRC Table R702.3.5 Note (e)

49. Green Board drywall: -- It shall not be used on the ceiling unless supported by framing 12" o.c.

50. **Stairs:**

a. 7-3/4" maximum rise,
b. 10" minimum tread,
c 6' - 8" minimum head room,
d. 36" minimum width.
e. Landings are required at main exit door and shall be full width of the door opening x 36" inches minimum.
f. Where a stairway of 2 or fewer risers is located on a exterior side of a door, other than required exit door, a landing is not required for the exterior side of the door provided the door, other than an exterior storm or screen door does not swing over the landing. IRC R311.4.3. (Any step over the threshold is the first riser measured from top of threshold to the step, from 0" to a maximum of 7-3/4")
g. Doors at the bottom of stairs shall have a 3' x 3' floor space before the door. IRC Section R311.5.

51. The installation of a diagonal riser that cuts a landing into two (2) treads shall not be allowed.

52. Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in a newel post or safety terminals. Handrail shall have a grip size surface of 1-1/4" minimum to 2" maximum. Install guardrails on all open sides of stairs with intermediate rails spaced less than 4" between rails, with the same height allowed for handrails. IRC R311.5.6.2, R311.5.6.3 & R312.2

53. SFD minimum insulation standards: R-30 for floors, R-19 for 2" x 6" walls, R-15 for 2" x 4" walls, R-38 for ceilings, and R-30 for cathedral ceilings.

54. Under slab R-10 high density insulation on the interior of the stem wall to 6" inches below outside grade and for 2' feet around perimeter of the building or R-5 for 4' feet around perimeter of the building. There shall be installed R-5 Rigid (1 inch) insulation between the top course of the stem wall and the slab as a thermal break.

55. Option: R-10 on the exterior of the stem wall from the footing up the top of the slab. The exposed insulation shall be covered with a protective metal Z flashing connected up on the wall framing and then covering the insulation down to 6" inches below grade.

56. Vertical 1 x ___ siding (board and batt, tongue and groove, or shiplap) shall be nailed to horizontal blocking placed in between studs, spaced 24" o.c., fully sheathed with 3/8" structural panel

57. 2" x ___" built-up girders, four (4) or more shall be joined together by 1/2" through bolts at 32" on center, staggered.

58. Masonry fireplaces: #4 vertical rebar at corners for a 40” wide chimneys, for chimneys wider than 40”, 2 additional # 4 bars shall be provided of each additional flue incorporated in the chimney or for each additional 40 inches in width or faction thereof maximum spacing of 24” o.c. (b) 1/4" bar horizontal at bed joint and 16" o.c. and #4 horizontal bond beams at 8' o.c., (c) Chimneys with multiple flues shall have a 4" masonry separation between flues, (d) Chimneys shall extend 2' above any portion of the structure within 10' and have a spark arrester. (e) Chimneys shall be anchored at each floor, ceiling or roof line more than 6 feet above grade. Two 3/16th inch by 1 inch strap shall be embedded a minimum of 12 inches into the chimney.

    Straps shall be hooked around the outer bars and extend 6” inches beyond the bend. Each strap shall be fastened to a minimum of four floor ceiling or floor joist or rafters with two ½ inch bolts, (f) Combustibles shall be kept 2" from the fireplace front face and sides and 4” from the back faces of the fireplace when framing is installed, (g) Masonry fireplaces supporting beams and ledgers shall be engineered.

59. Attic access through a fire resistive ceiling between a garage and a single family dwelling shall be made up of 3/4” plywood or osb and 5/8” type X sheetrock glued and screwed together and supported by a 5/8” type X drywall edge. A pull down ladder access shall have its assembly approved by the Building Official.

60. The rough-framed opening shall not be less than 22” inches by 30” inches, with an 30” inch minimum unobstructed headroom.

61. Where openings such as a garage doors are located in a wall that opens under protruding construction of the building or an exterior exit balcony the underside of the construction shall be built of one (1) hour fire resistive construction.

62. All attached garages (all U-1 occupancies) shall have 5/8" type X gypsum board on all walls and ceiling. Plastic pipe 1-1/2 or larger shall have an approved fire collar installed. Plastic pipe less than 1-1/2” shall have a 1/4” annular space round the pipe filled with fire rated caulking and the pipe penetration covered by a metal escutcheon plate. All openings into the garage shall be protected; for doors, 1-3/8” solid core self closing or a 20-minute labeled; duct openings shall have fire dampers.

63. 5/8” Type X gypsum board required on detached garages, 1,000 square feet or larger or considered 2 stories when within 25’ feet of single family dwelling or within 20’ feet of property lines.

64. Alterations to trusses. - Truss members and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without the written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heaters) shall not be permitted without verification that the truss is capable of supporting such additional loading.

65. Fire Blocking:

    a. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs.
        i. Vertically at the ceiling and floor levels.
        ii. Horizontally at intervals not exceeding 10’ feet.
        iii. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
        iv. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section IRC R311.2.2
        v. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with approved material to resist the free passage of flame and products of combustions. (Fire Caulked)
        vi. For the fire blocking of chimneys and fireplaces, see Section R1003.19

66. Glue-Laminated Beams exposed to weather may be used provided the Glue-Laminate Beam is primed and sealed (2 coats minimum) and that protection is maintained. These glue-laminated structural beams shall be manufactured with exterior glue.

67. No structure shall be occupied prior to the approval of the Final Inspection by the Building Department.

68. Washer and dryers shall not be located in garages. Washer and dryers in rooms adjacent to garages or in storage rooms shall be installed on a platform 8” above the floor. Metal laundry standpipe box are required in fire rated walls.

69. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

70. When clay soils are encountered at a building site as determined by a pre-construction soil investigation the footing design shall be done by an engineer licensed in The State of Arizona. If Inspector finds a condition exists in the first inspection a STOP WORK will be issued. Then a geotechnical report shall be submitted to the Building Department with an engineered footing design.

71. Amendments: Ordinance 2007.12

(1) ALTERNATE TYPE STAIRS IN RESIDENTIAL DWELLING UNITS

Alternate type stairs shall include spiral stairs, alternating tread stairs and a modified type stairs.

Spiral stairs shall meet the minimum size requirements of the IRC, section R311.5.8.1.

Modified type stairs shall be a minimum of thirty (30) inches wide, have a maximum unit rise of eight (8) inches, a minimum unit tread of nine (9) inches and meet all other code requirements for stairs such as headroom, guardrails and handrails.

Alternate type stairs shall be allowed as a component of the means of exit for areas limited to 400 square feet of habitable space. Alternate type stairs may be used as a secondary exit from any floor only when each floor has met all of the code requirements for exits.

(2) ATTICS, ATTIC SPACES, ATTIC ROOMS, BONUS ROOMS AND ATTIC TRUSSES.

a. Attics are unfinished space under the roof structure not intended for any use. Special provisions for attics are as follows:

   i. When an attic is made useable by a floor surface the average ceiling height of the useable space shall be six (6) feet or less.
   ii. Attics shall only be accessed through an attic access, scuttle or pull-down stairs.
   iii. When attics are intended to be useable the floor live load design shall be forty (40) pounds per square foot minimum.
   iv. When attics are unfinished and are sized according to attic spaces, attic rooms or bonus rooms there shall be disclosed on the property deed that any improvements or finish of the area shall require a building permit.

b. Attic spaces are areas with an average ceiling height of the useable space from more than six (6) feet to less than seven (7) feet and the use is intended for storage only. Special provisions for attic spaces are as follows:

   i. Attic spaces shall only be accessed through an attic access, scuttle or pull-down stairs.
   ii. Attic spaces shall have interior finish of fire resistive construction and two layer wood floor when attached to a dwelling unit or when the building is required to be fire resistive.
   iii. Attic spaces shall have a floor live load design of sixty (60) pounds per square foot minimum.
   iv. Attic spaces shall be considered as a story.
   v. Attic spaces shall have required attic ventilation. Attic spaces may have limited electric lighting and receptacle outlets as necessary.

c. Attic rooms are areas with an average ceiling height of the useable space from seven (7) feet and greater and the intended use is for storage or workshop only. Special provisions for attic rooms are as follows:

i. Attic rooms shall only be accessed from a properly sized exit access or stairs.
ii. Attic rooms shall have interior finish of fire resistive construction and a two layer wood floor when attached to a dwelling unit or when the building is required to be fire resistive.
iii. Attic rooms shall have the use disclosed on the deed that it is not to be used for habitable space and shall not be used for sleeping purposes.
iv. Attic rooms shall be considered as a story.
v. Attic rooms may have windows for ventilation, heat and electric.

d. Bonus rooms are areas where because of the shape of the roof or structure that additional floor area becomes useable. Bonus rooms are areas having an average ceiling height of the useable space from seven (7) feet six (6) inches and greater and the intended use is for habitable purposes only. Special provisions for Bonus Rooms are as follows:
i. Bonus Rooms shall follow all of the requirements for habitable space such as exit access, emergency egress, light and ventilation, heat, electric layout and shall be considered a place for sleeping purposes.
ii. Bonus rooms of conventional floor frame construction shall have a floor live load design of forty (40) pounds per square foot minimum.

e. Attic Trusses used for the construction of attic spaces, attic rooms and bonus rooms shall have the floor designed for a sixty (60) pound per square foot live load for the useable space. Useable areas in attics may have the truss floor live load design of forty (40) pound per square foot minimum.

Attic trusses as well as conventional floor framing used in detached accessory structures for accessory use (use other than residential dwelling) shall have the floor live load design of sixty (60) pounds per square foot minimum unless specifically designed for heavy storage.

ENERGY CODE – SCOPE OF WORK

1. Insulation requirements – Thermal barrier and envelope

    a. R-38 in the ceilings including the gable ends. R-30 minimum may be used for 2 feet around the edges at the truss ends and over the top of the exterior wall or use raised heel trusses. Use insulation baffles for air circulation or raised heel trusses. R- 30 for vaulted ceilings. In vaulted ceilings, air circulation and venting shall be maintained above the insulation by deeper roof framing or insulation baffles running continuous up the roof structure.
    b. R-19 for 2x6 wall framing, R-15 for 2x 4 wall framing. All corners and intersecting wall space at exterior locations shall be fully insulated by approved framing methods.
    c. All knee walls shall be fully insulated and have an air barrier installed on both sides of the wall which includes the attic side.
    d. R-30 for wood floor framing. Spaces of second floor framing that adjoin the exterior wall shall be insulated and the insulation held in place by approved methods.
    e. Under slab shall be insulated with R-10 high density insulation on the interior of the stem wall to 6 inches below outside grade and for 2 feet around the perimeter of the building or similarly R-5 for 4 feet around the perimeter of the building. There shall be installed R-5 rigid (1 inch) insulation between the top course of the stem wall and the slab as a thermal break. Option: R-10 on the exterior of the stem wall from the footing up to the top of the slab. The exposed insulation shall be covered with a protective metal Z flashing connected up on the wall framing and then covering the insulation down to 6 inches below grade or other approved methods.
    f. As an installation **BEST PRACTICE** all plumbing water pipes and vent pipes shall be routed through interior walls so as to allow full insulation in exterior wall cavities. Unless structural or architectural design prohibits pipes to be installed in interior walls then they may be routed in exterior walls.
    g. Sprayed Foam Insulation: Roof, back side of sheathing. Open cell foam; R-4 per inch, use 7 inches minimum. Closed cell foam; R-6 per inch, use 5 ½ inches minimum and cover the back side of the framing members. Walls fill the framing members. This applies to the Energy Code prescriptive methods.

2. Insulation installation – Alignment and contact of the insulation and the air barrier.

    a. An air barrier is a solid and rigid material that separates indoor (conditioned) and outdoor (unconditioned) air and makes up the inside surfaces of the insulated cavity. These materials include the drywall, panel sheathing and framing of the wall cavity, the floor sheathing of the floor assembly, the drywall of the ceiling and the interior surfaces of knee walls, dropped ceilings (soffits) and enclosures of concealed construction.
    b. Insulation shall be installed in full contact with the air barrier on all sides (6 sides) of the exterior wall cavity including knee walls. The insulation shall be installed so as not to create any voids around piping, wiring, blocking and any other obstruction within the wall cavity.

c. Insulation shall be installed in full contact with the conditioned side of the air barrier of the flooring above and in attics the ceiling covering below. The insulation shall be installed so as not to create any voids around piping, wiring, blocking and any other obstruction within the floor or ceiling cavity.

d. When faced insulation is used the tabs of the insulation facing shall be lapped over the framing members.

e. **NOTE – There shall now be required an Insulation Inspection before the installation of drywall which is after the Rough Trades Inspection.**

3. Air leakage – The building thermal envelope shall be durably sealed to limit air infiltration. The sealing methods between dissimilar materials shall include installation of air barriers, flashed, caulked, gasketed, or weather-stripped.

a. Air barriers shall be installed in the following locations: the attic sides of knee walls of intersecting floors and roofs, behind tubs and showers on exterior walls, dropped ceilings, chases and fireplace enclosures adjacent to the thermal envelope. All exterior sides of wall construction shall be fully sheathed or covered with exterior panel siding to meet the requirements for exterior air barriers.

b. Approved sill seal gasket material shall be installed under the bottom sill plate for slab on grade construction.

c. The exterior of all buildings shall be covered with approved Grade D permeable building wrap or building paper.

d. The openings of doors and windows shall be flashed by approved methods to prevent water and wind migration. Any voids between the door and window openings to the framing shall be insulated and caulked.

e. All penetrations of electrical wiring and plumbing through the top plate and bottom floor plates shall be caulked with a fire-resistive caulking material.

f. Duct, flue and piping shafts opening into unconditioned space shall be capped and sealed with solid material, flashing or blocking and any remaining gaps are sealed with fire resistive caulk or foam.

g. Ceiling penetrations such as light fixtures adjacent to the building thermal envelope shall be caulked or gasketed.

h. Recessed lighting fixtures shall be IC-rated (thermally protected) fixtures, insulated and the penetration to the unconditioned space shall be sealed by caulking or gasketing. A recessed light fixture may be installed in an airtight box with proper clearances to combustible material and the box insulated as required. A recessed light fixture may be installed according to manufactures specifications when complying with Title 24 (California Rating) requirements.

i. NOTE – There shall now be required a Building Wrap, Window/Door Flashing and Air Barrier Inspection after the Roof Sheathing, Sheer Wall and Anchorage Inspection. Penetration sealing shall be inspected at the Rough Trades Inspection.

4. Window type (fenestration) and skylights – The U-Factor.

   a. All windows shall be of the Low-E type and comply with the U-Factor of 0.45 minimum. **BEST PRACTICE** – Low-E windows with the U-Factor of 0.35. When metal or aluminum windows are used they shall be Low E with a thermal break and the U-factor shall be 0.45 minimum. Window labeling for these specifications shall stay in place through the Final Inspection. **EXCEPTION –** Windows used for the installation of glazing for approved passive solar design.
   b. Skylights shall have a U-Factor of 0.60 maximum.

5. Ducts – The R-value and installation of supply air and return air ducts.

   a. Supply air and return air ducts located in unconditioned spaces shall have an insulation value of R-8 minimum. Exceptions - In floor and attic trusses where the main trunk duct is run and an R-8 duct is too large to be properly installed, R-6 duct may be used. Ducts may be un-insulated when located completely inside the conditioned space. **NOTE – R-6 insulated ducts may be used until January 1, 2009 in unconditioned spaces. BEST PRACTICE – Use R-8 ducts as soon as they are available.**
   b. All rooms in a building, heated by a forced-air heating system, shall have a return air path by the use of a return air duct to each room, a "Jump Duct" between a room and the main return air, transfer grilles or use louver doors. Exception – bathrooms, toilet rooms, laundry rooms and similar spaces. No heating ducts may be installed in a garage or storage room unless return air is compensated from the outside (the source not through the garage, storage room or attic) and the system is installed by approved methods and equipment.
   c. Duct joints, connections to the duct register boot and plenums shall be sealed with water-based mastic at all joints to cause the duct system to be airtight. Duct tape will not be allowed as the sole method to seal the ducts at joints. Furnace equipment may be sealed with metallic duct tape.

6. Systems – For heat and water

   a. All fuel burning heating systems shall obtain all combustion air from the outside.
   b. All hot water piping located in unconditioned spaces shall be insulated with R-2 insulation minimum.
   c. Circulating hot water piping shall include an automatic or readily accessible manual switch to turn off the water circulation when the system is not in use.
   d. Mechanical ventilation of outdoor air intakes and exhausts shall have an automatic or gravity damper that close when the ventilation system is not operating.
   e. Equipment sizing for heating and cooling shall be in accordance with section M1401.3 of the International Residential Code, ACCA Manual J.

7. Moisture Control.

   a. An approved building wrap shall be installed on the exterior side of the building sheathing or over the stud surface when exterior panel siding is used for heated buildings.
   b. When an un-vented concealed crawl space is approved, the normal foundation vents shall be installed so in the event a water spill was to take place in the crawl space the vents would allow circulation of air for drying purposes. The foundation vents may be blocked off and insulated over for the system of the un-vented concealed crawl space.

8. Indoor air quality and positive pressure air balance in buildings.

   a. Outside air is **RECOMMENDED** to be supplied into the return air system of heating equipment to insure fresh air will be circulated through the building, sized and installed by approved methods. Fresh circulated air throughout the house will provide clean indoor air and control moisture. Outside air will allow a positive pressure air make-up when any exhausting air equipment is utilized.
   b. Outside air intakes shall be located where the supply will not be contaminated by vehicle fumes or noxious odors.
   c. In buildings heated by radiant systems where air is not circulated throughout, it is **RECOMMENDED** that an approved fresh air system be installed.
   d. In non-heating seasons and when air conditioning is not used or not installed it is presumed that some windows would be open to provide fresh circulated air through the house.

Energy Code Compliance for Climate Zone 4 – Greenehaven and Marble Canyon Only!
NOTE: Wood Frame Wall, R-13; Wood Frame Floor, R-19; everything else the same as Zone 5.

<u>2006 INTERNATIONAL PLUMBING CODE</u>

1. Annular spaces between sleeves and pipes shall be filled or tightly caulked as approved by the Building official. Annular spaces between sleeves and pipes in a fire-rated assemblies shall be filled or tightly caulked in accordance with the building portion of this code.

2. Any pipe that passes under a footing or through a foundation wall shall be provided with a relieving arch: or there shall be built into the masonry wall a pipe sleeve two (2) pipe sizes greater than the pipe passing through.

3. Exposed water pipes shall not be installed outside of a building or in attic spaces. When installed in crawl spaces or concealed in the outside walls or in any other place subjected to freezing temperature, adequate provision will be made to protect such pipes from freezing.

4. Exterior water pipe shall be installed not less than 12” inches deep and not less 6” inches below the frost line. (Minimum depth of water line is 36”).

5. Building sewer lines shall have a minimum of 12” of cover.

6. Where trenches are excavated such that the bottom of trench forms the bed for the pipe, solid and continuous load-bearing support shall be provided between joints. Piping shall not be supported on Blocks to Grade.

7. Backfill shall be free from discarded construction material and debris, backfill shall be free from rocks, broken concrete and frozen chucks.

8. All hot water piping located in unconditioned spaces shall be insulated with R-2 insulation minimum.

9. Pipes other than cast iron or galvanized steel in concealed locations, and are less than 1-1/2" to the nearest edge of stud, rafters, joist or similar members shall have a nail plate of (.062 thick) steel and shall cover area of the pipe. Also shall extend a minimum of 2” inches above sole plate and below top plate.

10. Pressure and temperature relief valves on water heaters shall be piped in accordance with:

    a. Shall not be directly connected to a drain system.
    b. Discharge through an air gap located in the same room.
    c. Not smaller than the diameter of the outlet of the valve.
    d. Serve a single relief device and shall not connect to piping serving any other relief device.
    e. Discharge to the floor, to an indirect waste receptor or to outdoors. Where discharging to the outdoors in areas to freezing, discharge pipe shall be first piped to an indirect waste receptor through an air gap located in a conditioned space.
    f. Discharge in a manner that dose not cause personal injury or damage to the structure.
    g. Discharge to a termination point that is readily observable by the building occupants.
    h. Not be trapped.
    i. Not to terminate more than 6” inches above floor or waste receptor.
    j. Not have a threaded connection at the end of such pipe.
    k. Not have valves or tee fittings.
    l. Use approved materials.

11. Where water heater or hot water storage tank are installed in locations where leakage will cause damage, the tank or water heater will be set in a galvanized steel pan of 24 gage think-ness or other approved pan.

12. The pan shall be not less the 1-1/2” inches deep and shall be of sufficient size and shape to receive all dripping or condensate. The pan shall be drained by an indirect waste pipe having a diameter of .75 inch.

13. The pan drain shall extend full-size and terminate over a suitably located indirect waste receptor or floor drain or extend to the exterior of the building and terminated not less than 6” or more then 24” above grade.

14. After construction or major repair, the water supply system shall be purged of deleterious matter and disinfected. Third party testing agency will perform this service and the report shall be given to the Building Official.

15. A means of protection against backflow shall be provided, In accordance to the degree of hazard.

    a. Air Gap
    b. Atmospheric-type vacuum breakers.
    c. Backflow preventer with intermediate atmospheric vent
    d. Pressure-type vacuum breakers
    e. Reduced pressure principle backflow preventer.
    f. Double check-valve assemblies.

16. Building sewers shall be provided with a cleanouts located not more than 100’ feet apart.

17. Cleanouts shall be installed at each change of direction greater than 45 degrees in the building sewer, building drain and horizontal waste or soil lines. Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40’ feet of developed length of the drainage piping.

18. A cleanout shall be provided at the base of each waste and soil stacks, Alternative, such cleanouts shall be installed outside the building within 3’ feet of the building wall.

19. An approved two-way cleanout shall be permitted to serve as the required cleanout for both the building drain and the building sewer.

20. Cleanouts shall be accessible. Minimum clearance in front of cleanouts shall be 18” inches on 3” inch and larger pipe, and 12” inches on smaller pipe. Concealed cleanouts shall be provided with access of sufficient size to permit removal of the cleanout plug and rodding of the system.

21. Cleanout opening shall not be used for the installation of new fixtures. Except where approved and an acceptable alternate cleanout is provided.

22. Vent Terminal shall not be used as a flag pole, TV aerials or similar uses.

23. An open vent terminal from a drainage system shall not be located less than 4’ directly beneath any door, openable window, or other air intake openings of the building, and any such vent terminal shall not be within 10’ feet horizontally of such openings unless the vent terminal is at least 2’ feet above the top of such opening.

24. Vent terminals extending through the wall shall terminate a minimum of 10’ feet from the lot line and 10’ feet above the average ground level. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening.

25. A connection between a vent pipe and a vent stack or stack vent shall be made at least 6” inches above the flood level rim of the highest fixture served. Horizontal vent pipes forming branch vents, relief vents or loop vents shall be at least 6” inches above the flood level rim of the highest fixture served.

26. Distance of trap from vent.

    a. 1-1/4” pipe, maximum of 5’ feet.
    b. 1-1/2” pipe, maximum of 6’ feet.
    c. 2” pipe, maximum of 8’ feet.
    d. 3” pipe, maximum of 12’ feet.
    e. 4” pipe, maximum of 16’ feet.

27. A vent shall not be installed within two (2) pipe diameters of a trap weir.

28. Common vent sizes.

    a. 1-1/2” pipe, maximum drainage from upper fixture drain (D.F.U.) – 1
    b. 2” pipe, maximum drainage from upper fixture drain (D.F.U.) – 4
    c. 2-1/2” to 3” pipe, maximum drainage from upper fixture drain (D.F.U.) – 6

29. When using IRC Plumbing Code, a schematic will be submitted for plan review and approval by the Building Department.

30. The vent shall be sized for the total drainage fixture unit.

Pipe size	(D.F.U.) Connect. To (HORIZ) Branch or stack	(D.F.U.) Connect to Building drain
2”	3	4
2 1/2"	6	24
3”	12	31
4”	20	50

31. Traps shall have a liquid seal not less than 2” inches and not more than 4”. Trap for floor drains shall be fitted with a trap primer..

32. The annular space between sleeves and pipes shall be filled or tightly caulked.

33. Standpipes shall extend a minimum of 18” inches and a maximum of 42” inches above the trap weir.

34. A laundry tray waste line is permitted to connect into a standpipe; the standpipe shall not be less than 30” inches as measured from the crown weir. The outlet of the laundry tray shall be a maximum horizontal distance of 30” inches from the standpipe. 1

35. A water closet, urinal, or bidet shall not be set closer than 15” inches from the center to any side wall, partition, or other obstruction, or closer than 15” inches from the center line of a bidet to the outermost rim of an adjacent water closet..

36. There shall be at least 21” inches clearance in front of the water closet, bidet or lavatory to any wall, fixture or door.

37. Plumbing fixtures that are used for domestic or culinary purpose shall not be used to receive the discharge of an indirect waste piping.

    a. A kitchen sink trap is acceptable for use as a receptor for a dishwasher.
    b. A laundry tray is acceptable for use as a receptor for a clothes washing machine.

38. Hose bibbs shall be protected by an atmospheric-type or pressure-type vacuum breaker or a permanently attached hose connection vacuum breaker.

39. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110 F by a water temperature limiting device.

40. All shower compartments shall have a minimum of 900 square inches of interior cross-sectional area. Shower compartments shall not be less than 30” inches in a minimum dimension measured from the finished interior dimensions.

41. The shower compartment access and egress opening shall have a minimum clear and unobstructed finished width of 22” inches.

42. The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120 F by a water temperature limiting device.

43. Access to a whirlpool pump shall be by manufactures specifications or 12” by 12” minimum sized access. Where pump is located more than 2’ feet from access,, 18” x 18” minimum sized access is required. The Door or panel shall be permitted to close the opening and shall be unobstructed.

44. The temperature of water from a tank-less water heaters shall be a maximum of 140 F when intended for domestic use.

45. Attics containing a water heater shall be provided with an opening and unobstructed passageway large enough to remove water heater. Passageway shall not be less than30” inches high and 22” inches wide and not more than 20’ feet in length. Passageway floor not less than 24” inches in width. Work space of 30” inches by 30” inches in front of water heater. The clear access opening shall be a minimum of 20” inches by 30” inches minimum or large enough to remove water heater.

46. Hose bibbs subject to freezing, including the “frost-proof” type, shall be equipped with an accessible shut-off valve inside the building so that so that they can be controlled and/or drained during cold periods.

Exception Frost-proof hose bibbs installed such that the stem extends through the building insulation into open heated or semi-conditioned spaces need not be separately valved.

47. Horizontal drainage pipe sized 3” inches and smaller shall be sloped 1/4” inch per foot minimum unless structural conditions prohibit, then for small sections where 1/8” inch per foot is minimum. Horizontal drainage pipe sized 4” inches and larger shall be sloped 1/8” inch per foot minimum.

48. See Piping support

    a. ABS – 4’ feet on center.
    b. Copper pipe – 12’ feet on center.
    c. Copper tubing 1-1/4” or smaller 6’ feet on center.

49. The Vent shall extend through the roof to be 12” inches minimum above the top of the flashing.

50. In areas as determined by the minimum frost depth of 30” inches, vent terminations shall be installed for vent extension through the roof for effects of snow accumulation and frost closure The minimum sized vent through the roof shall be 2” inches to prevent the effects of frost closure. Any increase in size of the vent shall be made inside the structure, 12” inches below the bottom of the roof framing or 12” inches below the bottom of the wall plates. At the point of the increase in size of the pipe, the pipe shall be adequately braced to prevent movement.

51. Air Admittance Valves are not allowed in residential or residential accessory buildings.

52. Exception – When structural conditions strictly prohibit the pathway for the proper run of a required vent to the outside as determined by the Building Official. Where an Air Admittance Valve is used a hard-wire gas detector shall be installed at the location within the room or within 8’ feet of the location measured horizontally.

53. Rodent proofing.

    a. Strainer plated shall have no opening greater than 1/2".
    b. Meter Boxes shall be constructed in a manner that rodents are prevented from entering a structure by way of the water service pipes.

    c. In or on the structures where opening have been made in walls, floors or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved metal collars that are securely fastened to the adjoining structure.

2005 NATIONAL ELECTRIC CODE

1. #4 ufer ground and water bond are required to service entrance, with no splices. Water bond sized - #4 for 200 amp, #6 for 100 amp. Gas pipe bond, sized - #8 for 100 amp, #6 for 200 amp. Two (2) 1/2" x 8' CU ground rod spaced 6' feet apart for pier construction and alterations, with a #4 grounding electrode conductor min. and acorn clamp. Services larger than 200 amp the grounding electrode shall be sized from Table 250-66. Amended Part VI, # 8

2. Ground Fault Circuits Interrupter (GFCI)

   Garages, and also accessory buildings (workshops, sheds, barns) that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use.

   Exception: Outlets serving dedicated equipment or tools or are not readily accessible.

   Laundry, utility, and wet bar sinks. Where the receptacles are installed to serve the countertop surfaces and are located within 6' of the outside edge of the wet bar sink and laundry sink. Receptacles shall not be installed in a face up position in the work surface or countertops.

   Electrically heated floors. (GFCI) Protection for personnel shall be provided for electrically heated floor in bathrooms, and in hydro-massage bathtubs, spa and hot tub locations.

4. Branch Circuits Required

   Central heating equipment other than fixed electric space heating shall be supplied by an individual branch circuit. Permanently connected A/C equipment, and auxiliary equipment directly associated with the central heating equipment such as (Pumps, Motorized valves, Humidifiers and Electrostatic Air Cleaners) shall not be prohibited from connecting to the same branch circuit as the central heating equipment. A minimum of two 20-amp branch circuits shall be provided to serve all wall, floor and countertops receptacle outlets located in the kitchen, pantry, breakfast area, dinning area or similar areas.

   (Exception) The outlet of the refrigerator may be a individual branch circuit of 15 amp or greater.

   A minimum of one 20-amp branch circuit shall be provided for receptacles located in the laundry area and shall serve only receptacles outlets located in the laundry area.

   A minimum of one 20-amp branch circuit shall be provided to supply bathroom receptacles outlets. Such circuits shall have no other outlets. (Exception) Where the 20-amp branch circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied.

   A receptacle outlet shall be installed at each wall counter space 12" inches or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 24" inches, measured horizontally from a receptacle outlet in that space.

At least one receptacle outlet shall be installed at each island counter space with a long dimension of 24” inches or greater and a short dimension of 12” inches or greater.

Where a range top or sink is installed in an island counter and the width of the counter behind the range top or sink is less than 12” inches the range top or sink has divided the island into two separate countertop spaces.

At least one receptacle outlet shall be installed at each peninsular counter space with a long dimension of 24” inches or greater and a short dimension of 12” inches or greater.

Countertop spaces separated by a range top, refrigerator, or sink shall be considered as a separate countertop space.

Receptacle outlets shall be located not more than 20” inches above the countertop. Receptacle outlets shall not be installed in a face-up position in the work surface or countertops,

(Exception) Receptacle outlets shall be permitted to be mounted not more than 12” inches below the countertop. In construction designed for physically impaired and for island and peninsular counter tops where the countertop is flat across the entire surface. Receptacles mounted below the countertop in accordance with the exception shall not be located where the countertop extends more than 6” inches beyond its support base.

Appliance receptacle outlets installed for specific appliances, shall be installed with in 6’ feet of the intended location.

At least one wall receptacle outlet shall be installed in bathrooms and such outlet shall be located with in 36” inches of the outside edge of each basin.

At least one receptacle outlet accessible at grade level and not more than 6’ feet 6”inches above grade, shall be installed outdoors at the front and back of the dwellings.

At least one receptacle outlet shall be provided for basement, garage, and detached garage that is provided with electrical power.

Hallways of 10’ feet or more in length shall have at least one receptacle outlet.

A 125-volt, single phase, 15 or 20 amp receptacle outlet shall be installed with in 25’ feet for servicing heating, A\C and refrigeration equipment.

5. Arc-Fault Circuit-Interrupter Protection

All branch circuits that supply 120-volt, single phase, 15 and 20 amp outlets installed in bedrooms shall be protected by a combination type or branch/feeder type arc-fault circuit interrupter installed to provide protection of the entire branch circuit. Effective January 1, 2008

Smoke detector circuit in bedrooms need not have arc-fault protection, Amended Part VI, # 5.

2005 NEC 210.52 FPN – Listed baseboard heaters include instructions that may not permit their installation below receptacle outlets.

6. Fixtures in Clothes Closets

Metal boxes and Metal Enclosure shall be grounded. Where non-metallic boxes are used with metal raceways or metal-armored cable, provisions shall be made for maintaining grounding continuity.

When installed in wet locations, 15- and 20- amp, 125- and 250-volt receptacles shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted. This will include outside locations subject to rain, spray from sprinkler systems and interior wet locations.

Areas protected from weather (damp location) may have receptacles that are protected when the plug cap in not inserted.

Luminaries installed in wet or damp locations shall be installed so that water cannot enter or accumulate in wiring compartments, lamp-holders or other electrical parts. All luminaries installed in wet locations shall be marked SUITABLE FOR WET LOCATIONS. All Luminaries installed in damp locations shall be marked SUITABLE FOR DAMP LOCATIONS.

Lamp-holders installed in wet or damp locations shall be of the waterproof type.

Cord-connected luminaries, cable- or cord-suspended-luminaries, light track, pendants, and ceiling-suspended (paddle) fans shall not have any parts located within a zone measured 3’ feet horizontally and 8’ feet vertically from top of bathtub rim or shower stall threshold.

7. Clearance and Installation

Recessed lighting fixtures shall be IC-rated (thermally protected) fixtures, insulated and the penetration to unconditioned space shall be sealed by caulking or gasketing. A recessed light fixture may be installed in an airtight box with proper clearances to combustible material and the box insulated as required. A recessed light fixture may be installed according to manufactures specifications when complying with Title 24 (California Rating).

Outlet boxes listed to support ceiling fans shall not support a fan that weighs more than 70 pounds. For outlet boxes that support ceiling fans that weighs more than 35 pounds the outlet box shall be marked to show maximum weight to be supported.

Outlet boxes or fittings installed as required by Section E3804.3 shall be permitted to support luminaries weighing 50 pounds or less. A luminaire that weighs more than 50 pounds shall be supported independently of the outlet box unless the outlet box is listed for the weight to be supported.

8. Mast used for support of the final span of overhead conductors shall be of adequate strength or be supported by braces or guy wires.

   Vegetation such as trees shall not be used for support of overhead conductor's spans.

9. Panel boards and over-current protection devices shall not located in clothes closets or bathrooms.

10. One or more disconnecting means shall be provided for all maintenance equipment other then lighting. The disconnecting means shall be readily accessible and within sight.

    Receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets except where located with in 18" inches of the wall.

11. Amendments:

    (1) Insulation of service entrance conductors – Amend Article 230-41 by deleting Exceptions 1, 2, 3, 4, and 5, and to read as follows: The grounded conductor shall be insulated.

    (2) Bond other enclosures – Amend Article 250-96 by adding 250-96C to read as follows: Whenever concrete or eccentric knockouts are encountered throughout a metallic raceway electric system, equipment ground continuity shall be maintained by Bonding Bushing and Jumpers.

INTERNATIONAL MECHANICAL & FUEL GAS CODE

1. L.P. equipment installed in a crawl space or daylight basement shall have an approved means to drain any unburned L.P. gas to the outside. L.P. equipment shall not be installed in any pit. Combustion air shall not be obtained in to a LPG appliance location from an under floor crawl space where the combustion air opening through the floor would allow the gas to drain into the crawl space Amended Part II, # 2.

2. Closable type not allowed, when gas fired appliances are located in a crawl space and depend upon combustion air supplied through those foundation vent openings. Metal louvers will have a 75-percent free area if it is not known. If it is known then use it in the calculation of the size of opening required. IRC G2407.10

3. Cooling coils, Evaporator or fuel-burning appliances, located in attics or furred spaces where damage may result from condensate overflow, shall be conveyed from the drain pan outlet to an approved place of disposal.

   a. Components of the condensate disposal system shall be of approved material. Condensate waste and drain line size shall be not less than 3/4"-inch internal diameter. All horizontal sections of drainage piping shall be installed in a uniform alignment at a uniform slope.

b. In addition a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal. Drain piping shall be a minimum of 3/4" nominal pipe size.

c. On down-flow units and all other coils that have no secondary drain and no means to install a secondary drain. A water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the equipment served in the event that the primary drain becomes restricted.

d. Piping and fittings for refrigerant vapor lines shall be insulated with at least R-4 and having external surface permeance not exceeding .05 perm.

e. When condensate water is approved to drain on the ground outside of buildings the condensate shall drain on to a concrete gutter stone 3 feet long minimum so as not to collect water against the foundation. The discharge of the condensate from the gutter stone shall drain out into the yard and away from the building. Amended Part II, # 10

f. Condensate drains shall be trapped as required by the equipment or appliance manufactures specification.

4. When a dryer is located in a closet 100 square inches of make-up air shall be provided in the door or by other approved means.

a. Dryer duct shall not be installed within any fire-blocking, draft-stopping or any wall, floor/ceiling or other assembly, required to be fire-resistance rated. Fire dampers shall not be installed in clothes dryer exhaust duct systems.

b. Screens shall not be installed at the duct termination.

c. Ducts shall not be connected or installed with sheet metal screws.

d. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

e. Clothes dryer transition ducts used to connect appliance to the exhaust duct system shall be metal and limited to a single length not to exceed 8’ feet in length.

f. The exhaust duct shall be a minimum of 4” inches in diameter, supported and secured in place.

g. The maximum length of a clothes dryer exhaust duct shall not exceed 25’ feet from dryer location to the outlet terminal. The maximum length of the duct shall be reduced 2’ 6” for each 45 degree bend and 5’ feet for each 90 degree bend. When manufacture specification of the dryer being used is provided to the Building Official. Then the maximum length of a dryer exhaust system may be increased.

h. Where a compartment or space for clothes dryer is provided, an exhaust duct system shall be installed.

5. Water heater, furnace and boilers, gas or electric, shall not be allowed in under stair locations, bedrooms, bathrooms, toilet rooms, clothes closets or in spaces having access through such rooms and spaces

Exception 5 of IRC G2406.2 will apply as an option. Furnace or water heater closets may access through a bedroom, bathroom or toilet room when all combustion air is taken from the outside and the door is a 1-3/8" inch solid core, fully weather stripped and self closing. Combustion air shall comply with 6

Vented gas heaters, fireplaces, decorative appliances and wood burning fireplaces and stoves located in bedrooms and bathrooms shall be direct vent only.

6. All structures served by gas shall have an APPROVED EXTERIOR BALL VALVE gas shut-off valve on the piping, located outside and adjacent to the building, near where the pipe enters the building. On the discharge side of the gas shut-off valve a union shall be installed. In areas where the gas pipe emerges out of the ground the union shall be of the isolating type.

7. Underground non-metallic gas yard line shall have a yellow insulated copper tracer wire or other approved conductor shall be installed adjacent to underground non-metallic piping. The tracer wire size shall not be less than 18 AWG and the insulation type shall be suitable for direct burial.

8. A rigid connection shall not be allowed between gas appliances and gas piping. The connection shall be made to a rigid nipple outside the appliance with an APPROVED appliance connector.

   Exception: Corrugated Stainless Steel Tubing (CSST) gas piping extended out of the wall installed according to manufactures installation instructions where 3' feet maximum of CSST piping connects to an appliance shut-off valve and then to a union connected to the rigid nipple.

9. Where in contact with material or atmosphere exerting a corrosive action, metallic piping and fittings coated with a corrosion-resistant material shall be used.

10. Gas piping shall not be installed through a circulating air duct, clothes chutes, chimney or gas vent, ventilating ducts, dumbwaiter, elevator shaft or solid construction. Unions, tubing fittings, right & left coupling & bushings, compression couplings and swing joints shall not be installed in concealed construction. Exception: Fittings listed for use in concealed construction.

11. The unthreaded portion of the piping outlets shall extend not less than 1" inch through finish ceiling or walls and not less than 2" inches through floors, outdoor patios and slabs.

12. Gas piping shall be tested for 15 minutes.

13. The test pressure shall be no less than 1-1/2 times the maximum working pressure. (10 psi) minimum. Medium pressure test (60 psi) for 30 minutes.

14. Drips shall be provided with a ready access to permit cleaning or emptying. A drip shall not be located where the condensate is subject to freezing. (Wet Gas Only)

15. Shutoff valves shall be located in a place so as to provide access for operation and shall be installed so as to be protected from damage.

16. Out Door Combustion Air

a. One permanent opening, commencing within 12” inches of the top of the enclosure, shall be provided. The appliance shall have a clearance of at least of 1” inch from the sides and back and 6” inches in front. The opening shall directly communicate with the outdoors or through a vertical or horizontal duct to the outdoors, or spaces that freely communicate with the outdoors and shall have a minimum free area of 1 square inch per 3,000 Btu/h of the total input rating of all appliances located in the enclosure and not less than the sum of the area of all vent connectors in the space.

b. Two permanent openings, one commencing within 12” inches of the top and one commencing within 12” inches of the bottom of the enclosure, shall be provided. The opening shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors.

When directly communicating with the outdoors, or where communicating with the outdoors through a vertical duct, each opening shall have a minimum free area of 1 square inch per 4,000 Btu/h of total input rating of all appliances in the enclosure.

Where communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of 1 square inch per 2,000 Btu/h of total input rating of all appliances in the enclosure. IRC G2407.6.1

c. Furnace’s in garages shall have high / low combustion air directly from the outside.
d. Where corrosive or flammable fumes or gases are present.
e. Equipment and appliances having an ignition source shall be elevated such that the source of ignition is not less than 18” above the floor in hazardous locations and public garages, private garages, repair garages, motor fuel-dispensing facilities and parking garages.

17. Under Ground Tank Requirements.

a. Underground LP tanks shall be listed for that use.
b. Tanks shall be buried with the top of the tank at least 6” inches below ground, No vehicular traffic. 2’ feet below when subject to vehicular traffic or use 6” inches of reinforced concrete. Need 6” of clearance around under ground LP tank.
c. Provide a manhole above grade for connections and valves.
d. Containers shall be protected against corrosion for soil condition at the site. Any damage to the coating shall be repaired before back filling.
e. Containers shall be set level on firm earth free from rocks on a 6” inch clean sand bed. Back fill shall be clean sand or clean earth free from rocks and abrasives. NO CINDERS.
f. An anode for cathodic protection shall be installed as per tank size.
g. Tank shall be supported on 2 – concrete footing dead men and anchored with a minimum 3/16” stainless steel, or other non-corrosive cable, or nylon straps, attached to the footing to prevent flotation. Dead men size 12” x 12” x 48” minimum. This footing is for tanks up too 500 gals. Tanks larger than 500 gals. Shall have dead men of 32” x 12” x 48” minimum.

h. Underground tank gas piping system shall be installed as a two stage regulator system.
i. The regulator vent shall extend above the highest flood level in the dome of an underground LP tank.
j. Medium pressure lines tested at 60psi for 30 minutes.

18. Un-vented decorative appliances, fireplaces, and room heaters are not allowed regardless of the location or type of fuel.

19. Equipment in Attics

a. 20" x 30" Access, where such dimensions are large enough to allow removal of the largest appliance.

b. Clear and unobstructed passageway large enough to allow removal of the largest appliance, but in no case less than 30" in height and 22" wide. And not more than 20' long.
c. The passageway shall have a continuous solid flooring not less than 24" wide.
d. A level service space at least 30" deep and 30" wide shall be present along all sides of the appliance where access is required.
e. Trusses shall be designed to carry the extra load of the equipment that will be installed in attic locations. Also a raised passageway and a raised platform shall be installed so R-30 Insulation may be installed under these areas.

20. Equipment in Crawl Spaces

a. 22" x 30" Access, where such dimensions are large enough to allow removal of the largest appliance.
b. Clear and unobstructed passageway large enough to allow removal of the largest appliance, but in no case less than 30" in height and 22" wide. And not more than 20' long.
c. If the depth of the passageway or service spaces exceeds 12" inches below the adjoining grade, the wall of the passageway shall be lined with concrete or masonry in accordance with Chapter 4.
d. A level service space at least 30" deep and 30" wide shall be present along all sides of the appliance where access is required
e. Appliances supported from the ground shall be level and firmly supported on a concrete slab or other approved materials extending above the adjoining ground.
f. Appliances suspended from floor shall have a clearance of not less than 6" inches from the ground.
g. A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the appliance location.

21. Flood hazard - For structures located in flood hazard areas, mechanical systems, equipment and appliances shall be located at or above the design flood elevation and shall comply with the flood-resistant construction requirements of the International Building Code

22. Rodent proofing - Buildings or structures and walls enclosing habitable or occupiable rooms and spaces in which persons live, sleep or work, or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed to protect against the entrance of rodents in accordance with the International Building Code.

23. Alteration of trusses, see # 78 of the Building Section.

24. Anchorage of appliances. – Appliances designed to be fixed in position shall be fastened or anchored in approved manner.

25. Private garages. – Appliances in garages and carports shall be installed with a minimum of 6' feet above the floor for suspended Units.

    When Water heaters, Boilers and Furnaces are located in a garage and subject to physical damage, they shall be protected.

26. Clearance above Grade. – Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved materials extending above adjoining grade a minimum of 6" inches.

27. Vent and chimney installations shall be fire blocked.

28. Vent and Gas Vent Terminations.

    a. Natural draft appliances and type B or L gas vents - Vents shall terminate at least 5' feet above the highest connected appliance outlet.
    b. B-W gas vent or Natural draft gas vents serving wall furnaces shall terminate at an elevation at least 12' feet above the bottom of the furnace.
    c. Type L vents – As per manufactures specifications, not less than 2' feet above the roof and not less than 2' feet above any portion of the building with in 10' feet. With a listed and labeled cap.
    d. Direct vent – Vent terminals for direct-vent appliances shall be installed in accordance with the manufacturer's specifications.
    e. Mechanical draft systems – shall be installed in accordance with manufacturer's specifications. Except direct vent appliances.

        i. The vent terminal shall be located not less than 3' feet above a forced air inlet located with in 10'feet.
        ii. The vent terminal shall be located not less than 4' feet below, 4' feet horizontally from or 1' foot above any door, window or gravity air inlet into a dwelling.
        iii. The vent termination point shall not be located closer than 3' feet to an interior corner formed by two walls perpendicular to each other.
        iv. The bottom of the vent terminal shall be located at least 12" inches above finished ground level.
        v. The vent termination shall not be mounted directly above or within 3' feet horizontally of an oil tank vent or gas meter.

vi. Power exhauster terminations shall be located not less than 10’ feet from lot lines and adjacent buildings.
vii. The discharge shall be directed way from the building.

f. Chimney termination. – Low heat.

i. 3’ feet above the highest point where they pass through a roof.
ii. 2’ feet higher than any portion of the building within horizontal distance of 10’ feet
iii. Approved spark arrestor.

g. Gas vents Termination.

i. Gas vents that are 12” inches or less in size and located not less than 8’ feet from a vertical wall or similar obstruction shall terminate above the roof in accordance with figure

29. Amendments: Ordinance 2007.12

(1) Combustion air drawn from outdoors – Amend IFGC 304.1 and IRC G2407.1 by adding IFGC 304.1.0.1 and IRC G2407.1.0.1 to read as follows: New construction and existing buildings that have been remodeled and durably sealed against air infiltration as regulated under the International Energy Conservation Code shall be considered Unusually Tight Construction. All fuel burning appliances shall have the required combustion air drawn from outdoors. All appliances within habitable portions of a building shall be installed in a sealed compartment with outside combustion air or be of Direct-Vent type.

Exception to this requirement shall include: Gas cloth dryers, Gas cooking range and oven, and the choice of one (1) wood stove, or one (1) fireplace, or one (1) free standing vented heater or one (1) Vented wall heater.

(2) Prohibited locations for gas piping – Amend IFGC 404.1 and IRC G2415.4 by deletion and IFGC 404.11 and IRC G2415.11 by adding IFGC 404.11.1 and IRC G2415.11.1 as follows: Delete IFGC 404.1.1 and IRC G2415.4. The gas pipe shall emerge out of the ground before entering any foundation wall of basements or crawl space.

Gas piping shall not be installed in or on the ground under any building or structure and exposed gas piping shall be kept at least 6” inches above grade. The term building or structures shall include structures such as porches, steps, whether covered or uncovered, breezeways, roofed patios, carports or drives, covered walkways, paved driveways and similar structures or appurtenances.

Exception – Gas piping installed below grade under buildings or structures when placed in approved recessed channels or conduit that are properly vented as described in IFGC 404.11 and IRC G2415.11. (This does not include piping entering below grade into foundations or basements or crawl spaces).

(3) Approved connections to liquid petroleum gas (LPG) tanks – Amend IFGC 404.7 and IRC G2415.7 by adding 404.7.1 and IRC G2415.7.1 as follows:

The connection of the building gas yard line to the regulator at the LPG tank shall be a rigid pipe or an approved, listed and labeled exterior flex connector (Manufactured Home Flex Connector) sized for the full demand of fuel to be served.

The copper tubing that is generally used as the connection from the tank to the regulator is a material that can be damaged when exposed above ground outdoors. The copper tubing shall be installed as short as practical, to compensate for expansion, contraction, jarring, vibrations and settlement (by the use of bends, loops or offsets) as required by NFPA 58 section 3-2.10.6, and protected from physical damage by being installed under the protective dome of the LPG tank.

(4) Minimum burial depth for gas piping

a.) Black iron - approved underground burial – twelve (12") Inches minimum cover.
b.) Plastic pipe - approved non-metallic – eighteen (18") inches minimum cover.

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Contact Phone: (928)-679-8850
Web Site: www.coconino.az.gov